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TITLE 178 ENVIRONMENTAL HEALTH

CHAPTER 4 PUBLIC SWIMMING POOL DESIGN AND CONSTRUCTION STANDARDS

4-001 SCOPE AND AUTHORITY: These regulations establish standards for swimming pool design, review, construction, approval, and related requirements. The authority for these regulations is found in Neb. Rev. Stat. §§71-4301 through 71-4307.

4-001.01 Related Regulations: Persons designing and/or constructing swimming pools may want to consult other regulations and/or codes which may apply, such as standards for special types of swimming pools, electrical codes, plumbing codes, water and wastewater regulations.

4-002 DEFINITIONS

Class A Pool means a pool operated by a municipality, political subdivision, or governmental agency; or a pool intended for use for accredited competitive aquatic events such as Federation Internationale de Natation, U.S. Swimming, U.S. Diving, National Collegiate Athletic Association, National Federation of State High School Associations, etc.

Department means the Department of Health and Human Services Regulation and Licensure.

Lazy River Ride means a water recreation attraction designed to convey bathers around a relatively flat course using an artificially created current.

Owner means the owner or the owner's representative.

Patron means a person using the swimming facility at a public swimming pool.

Person means any individual, firm, partnership, association, corporation, company, municipality, political subdivision, community government agency, club, organization, or other entity owning or operating a swimming pool as defined in Neb. Rev. Stat. § 71-4301.

Spa means a pool designed for recreational use and not drained, cleaned, and refilled for each individual. It may include, but is not limited to, hydrojet circulation, hot water, cold water, mineral baths, air induction systems, or any combination thereof.

Special Purpose Pool means a pool that is operated for special purposes and incorporates features distinguishing it from a traditional swimming pool. Special purpose pools include, but are not limited to spas, wading pools, wave pools, zero depth pools, water slide splash pools, lazy river rides, and spray parks with fountains and/or other interactive water features.

Spray Park means a special purpose pool providing recirculated water to spray features with no standing water accessible to pool patrons.

Substantial Modification or Improvement means addition of a spa to an existing swimming pool, construction that changes the depth, shape, piping, pumping, or other basic design features of a public swimming pool in a manner that affects pool patron safety or recirculation system design, changes a pool's deck, changes the basic design of a diving board, or adds a special feature. Work not considered a substantial modification or improvement includes maintenance and repairs.

Swimming Pool means any artificial basin of water modified, improved, constructed, or installed solely for the purpose of public swimming, wading, diving, recreation, or instruction. Swimming pool includes, but is not limited to, a pool serving a community, a subdivision, an apartment complex, a condominium, a club, a camp, a school, an institution, a park, a manufactured home park, a hotel, a motel, a recreational area, or a water park. Swimming pool includes a spa, hot tub, or whirlpool or similar device which (1) is designed for recreational use and not to be drained, cleaned, and refilled after each individual use and (2) may consist of elements, including, but not limited to, hydrojet circulation, hot water, cold water, mineral baths, air induction systems, or any combination thereof. Swimming pool does not include an artificial lake, a pool at a private residence intended only for the use of the owner and guests, or a pool operated exclusively for medical treatment, physical therapy, water rescue training, or training of divers.

Variance means written approval from the Department to allow a design, or substantial modification or improvement that does not conform to the requirements in 178 NAC 4. A variance will not be given for any design, modification or improvement that endangers the health or safety of the patrons.

Wading Pool means a pool that is no more than 24 inches deep that is intended for use by young children.

Waiver means written approval from the Department to not meet the requirements of 178 NAC 4 for substantial modifications or improvements to existing swimming pools. A waiver will not be given for any design, modification or improvement that endangers the health or safety of the patrons.

Wave pool means a special-use pool with wave generating equipment and a design which provides for control of the waves within the side walls and dissipation of the waves at a zero depth shallow end.

Zero Depth Pool means a swimming pool where the pool floor intersects the water surface along a portion of its perimeter.

4-003 PLANS AND SPECIFICATIONS: Plans, specifications, and a swimming pool data sheet (Attachment 3 which is incorporated herein by reference) for new swimming pools or substantial modifications or improvements to existing pools must be prepared by a professional engineer or professional architect registered by the Nebraska Board of Engineers and Architects to practice in the State of Nebraska. All plans and specifications must be submitted to the Department in triplicate, with plans laid out on sheets having a minimum size of 11 by 17 inches. Additional sets may be submitted for formal designation as approved copies if desired. Plans and specifications for substantial modifications or improvements must include all applicable portions of the swimming pool. The owner of a pool may submit plans and specifications for pool water treatment modifications instead of a professional engineer or registered architect.

4-003.01 Content: Plans, specifications, and reports submitted for formal approval must be an accurate record of the proposed construction and contain sufficient information to demonstrate to the Department that the proposed swimming pool or substantial modifications or improvements will meet the standards contained herein and must include, at a minimum, the following documentation and information:

1. Location and Owner: Name and address of the proposed, modified or improved public swimming pool facility; and the name, address, and phone number of the owner.

2. Scale and Northpoint.

3. Designer Information: Name, date, address, phone number, professional seal and signature of the designing engineer or architect.

4. Plot Plan: A plot plan of the property to be used, indicating the topography, grade elevations, arrangement, and location of present and proposed structures; location of site utilities; and location of the proposed swimming pool, pool enclosure, and deck.

5. Detailed Plans: All detailed plans for a swimming pool must be legible and must be drawn to a suitable scale. The detailed plans for facilities must show:

    a. Construction Details: Complete construction details, including dimensions, elevations, and appropriate cross sections for the swimming pool, pool deck, and pool enclosure.

    b. Recirculation System: Schematic diagrams and plan elevation view of the pool water treatment and recirculation systems, pool equipment room, and pool and equipment room ventilation.

    c. Piping: Size and location of all piping.

d. Specifications: Complete, detailed specifications for the construction of the swimming pool, bathhouse, recirculation system, filtration system, disinfection equipment and all other appurtenances.

6. Fees

a. Initial Fee: When the architect's or engineer's plans and specifications are submitted, an initial review fee of $100 plus five tenths of 1% of his/her estimate of the cost of the project described in the documents to be reviewed up to a maximum of $ 7,600 must be included.

b. Final Fee: Upon completion of the project, the owner or owner's representative must submit documentation of the contract or actual cost of the project in the form of the actual contract or invoice(s) to the Department for the purpose of determining the final fee amount. Payment of the final fee amount must be made prior to final inspection.

7. Operation and Maintenance Manual: Before final approval is given, an operation and maintenance manual containing the items listed in 178 NAC 4-006.16B must be provided to the swimming pool owner.

4-003.02 Swimming Pool Data Sheet: (Attachment 3) must be submitted with the plans and specifications.

4-003.03 Preliminary Plans: Preliminary plans, specifications, or concepts may be submitted for review prior to preparation of construction documents, allowing 30 working days for comment by the Department. An initial fee for review of preliminary plans must be submitted with the plans as required in 178 NAC 4-003.02 item 6. This fee will be credited toward the review fee required when final plans and specifications are submitted for review. Any comments or agreements made regarding preliminary plans do not constitute approval to construct the project. If preliminary plans are submitted for a project, reference to any correspondence must be included in the final plan submittal.

4-003.03 Final Plans: All swimming pool data sheets, the initial fee, and construction documents for formal approval of a public swimming pool must be submitted for review and comment or approval at least 30 working days prior to planned construction or installation. Time must be allowed for the incorporation of changes if required.

4-003.04 Construction Approval: Final plans, specifications, a swimming pool data sheet, and other relevant data must be approved by the Department before construction or installation of any new swimming pool or substantial modification or improvement to any swimming pool may begin. Written notification and approval of plans and specifications as

constitutes a permit for construction, provided construction is started within six months. When construction is delayed beyond six months it will be necessary for the owner to obtain an extension in writing from the Department.

4-003.05 Construction: All new swimming pools and substantial modifications or improvements must be completed in accordance with approved plans and specifications or approved change orders.

4-003.06 Certification: The design engineer, architect, or the owner's representative, as appropriate, must certify in writing to the Department on Attachment 4 that the pool and all appurtenances have been constructed in accordance with approved plans and specifications, prior to a final inspection.

4-003.07 Final Inspection: The Department will conduct a final inspection and note any deficiencies, which must be resolved, before the Department may issue a permit to operate the pool. The Department has the right of entry at any reasonable time to the swimming pool and accompanying facilities for this purpose.

4-003.08 Final Approval: If no deficiencies are found when the Department conducts the final inspection or when any deficiencies that were found in the Department's final inspection have been corrected, the owner may apply for a permit to operate the pool.

4-003.09 Disapproval: The Department reserves the right to disapprove any design features where the designer has not demonstrated to the satisfaction of the Department that the standards have been met.

4-003.10 Record Drawings: Pools that are already constructed or on which construction has begun without prior plan review and approval will not be issued a permit to operate until after the record drawing plans and specifications have been reviewed and approved by the Department. If the pool is being operated without appropriate approval, the permit may be suspended or revoked after the applicant or the person to whom the permit has been issued is given notice in writing of the failure to comply with Neb. Rev. Stat. §§71-4301 through 71-4307 or the rules and regulations developed under those statutes. If the permit is suspended or revoked, the person to whom the permit has been issued may request a hearing before the Department within ten days of receipt of notice of the suspension or denial. On the basis of the hearing, the Department will affirm or revoke its previous action.

4-004 WAIVERS AND VARIANCES

4-004.01 General: A waiver or a variance must be requested on Attachment 1 or Attachment 2, respectively, to 178 NAC 4, which are incorporated herein by reference. A

waiver or a variance may not pose an increased public health or safety risk. A request for a waiver or variance must be made to the Department in writing a minimum of 30 working days before construction begins.

4-004.02 Waiver: A request for a waiver may be made for a modification to existing swimming pools where space and/or other circumstances prevent the project from meeting the current requirements.

4-004.03 Variance: A request for a variance may be made for a project where the engineer or architect believes that a variation in the standards provides equal or greater health and safety protection.

4-004.04 The Department will review and approve or disapprove requests for a waiver or variance on a case-by-case basis.

4-005 RIGHT TO HEARING: The Department may deny, suspend, or revoke any permit for construction of a swimming pool for failure to comply with any of the provisions of Neb. Rev. Stat. §§ 71-4301 through 73-4307 or 178 NAC 4. Before a permit is denied, suspended or revoked, the Department will inform the person to whom the permit has been issued in writing enumerating instances of failure to comply. If the permit is denied, suspended or revoked, the person to whom the permit has been issued may request a hearing before the Department within ten days of receipt of notice of such denial, suspension, or revocation. On the basis of the hearing, the Department will affirm or revoke its previous action.

4-006 DESIGN STANDARDS: The following standards are adapted from the *Recommended Standards for Swimming Pool Design and Operation,* 1996*,* by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. Copies are available from Health Education Services, A Division of Health Research Inc., P.O. Box 7126, Albany, New York 12224, Phone: 518-439-7286. Sections 4-006.09A and 4-006.10 are used with permission from ANSI/NSPI-1, Draft 2003, American National Standards for Public Swimming Pools, ANSI/NSPI, 2111 Eisenhower Ave., Alexandria VA 22314. Phone: 703-838-0083.

4-006.01 Existing licensed swimming pools constructed or under construction prior to June 8, 2004, which do not fully comply with the design and construction requirements of these regulations may be continued in use as long as the swimming pool meets the current operating requirements in 178 NAC 2, poses no significant health or safety risks, and is operated and maintained as designed.

4-006.02 Maximum Swimming Pool Patron Loading

4-006.02A Designation of Areas: For purposes of computing patron load, those portions of the swimming pool 5 feet or less in depth are designated the “shallow area.” Those portions of the swimming pool over 5 feet in depth are designated the “deep area.”

4-006.02B Area Loading

4-006.02B1 Shallow Area: Fifteen square feet of pool water surface area must be provided for each patron. This also applies to spray parks without standing water.

4-006.02B2 Deep Area: Twenty-five square feet of pool surface area must be provided for each patron.

4-006.02C Diving or Slide Area: Where a separate designated diving or slide area is provided, and other swimmers are not allowed in this area, it may be excluded from the surface area used for computing patron load; however, ten patrons must be included for each board, platform or slide.

4-006.02D Additional Area Allowance: Additional allowance will be made on the basis of one additional patron per each 50 square feet of pool deck in excess of the minimum area of deck required, and one additional patron per each 100 square feet of picnic and play area within the enclosure.

4-006.03 Construction Material

4-006.03A Materials: Swimming pools must be constructed of materials which are inert, stable, non-toxic, watertight and enduring. Sand or earth bottoms are not permitted.

4-006.03B Finish: Bottom and sides must be white or a light color, with a smooth and easily cleanable surface. The finish surface of the bottom in shallow areas [5 feet or less in depth] must be slip-resistant.

4-006.04 Design, Detail and Structural Stability: All swimming pools must be designed and constructed to withstand all anticipated loading for both full and empty conditions. A hydrostatic relief valve and/or a suitable underdrain system must be provided for in-ground pools. The designing architect or engineer is responsible for ensuring the stability of the pool design for both full and empty conditions.

4-006.04A Shape: The shape of any swimming pool must be such that the circulation of pool water and control of swimmers' safety are not impaired. There may not be any underwater projections or obstructions which would endanger patron safety or interfere with proper pool operation.

4-006.04B Bottom Slope: The bottom of the pool must slope toward the main drain. Where the water depth is less than 5 feet, the bottom slope must not exceed 1 foot vertical in 12 feet horizontal (1:12). Where the water depth exceeds 5 feet, the bottom slope must not exceed 1 foot vertical in 3 feet horizontal (1:3).

4-006.04C Area Marked: The boundary line between the shallow and deep areas must be marked by a line of contrasting color at least 4 inches wide on the floor and walls of the pool, and by a safety rope and floats equipped with float keepers. Safety rope anchors must be recessed.

4-006.04D Pool Walls: Walls of a swimming pool must be either:

1. Vertical for water depths of at least 6 feet, or
2. Vertical for a distance of at least 3 feet below the water level, below which the wall may be curved to the bottom with a radius not greater than the difference between the depth at that point and 3 feet, provided that the vertical is interpreted to permit slopes not greater than 1 foot horizontally for each 5 feet of depth of sidewall (11 degrees from vertical).

4-006.04E Ledges: Ledges must not extend into the pool unless they are essential for support of the upper wall construction.

4-006.04F Pools Without Gutters: Coping or cantilevered deck may project from a swimming pool or spa wall to provide a handhold for users. The coping or deck must be rounded, have a slip-resistant surface finish, and must not exceed 3-1/2 inches in thickness. The overhang of the coping or deck must not exceed 2 inches or be less than 1 inch. All corners created by coping or cantilevered deck must be rounded in both the vertical and horizontal dimensions to eliminate sharp corners. The handgrip must not be more than 9 inches above the minimum skimmer operating level.

4-006.04G Diving Areas: The minimum dimensions of the swimming pool and appurtenances in the diving area must conform to 178 NAC 4 Table 1. (Note: These diving area dimensions may not meet the requirements of NCAA, US Diving, FINA, NF of SHSA, or AAU. Where competitive diving or competitive-type diving boards are used, compliance with NCAA, U.S. Diving, FINA, NF of SHSA, or AAU requirements is recommended.)

4-006.04G1 Head Room: There must be a completely unobstructed clear distance of 16 feet above the diving board measured from the center of the front end of the board. This area must extend at least 8 feet behind, 8 feet to each side, and 16 feet ahead of the measuring point.

4-006.04G2 Diving Boards and Platforms: Diving boards and platforms in excess of 3 meters in height are prohibited except where special design considerations and control of use are provided.

4-006.04G3 Steps and Guard Rails for Diving Boards: Supports, platforms and steps for diving boards must be designed and constructed to safely carry the maximum anticipated loads. Steps must be of corrosion-resistant

material, easily cleanable and of non-slip design. Handrails must be provided at all steps and ladders leading to diving boards more than 1 meter above the water. Platforms and diving boards which are more than 1 meter high must be protected with guard rails at least 36 inches high, extending at least to the edge of the water. Boards or platforms 3 meters (9.8 ft.) or higher, when permitted, must have an effective side barrier.

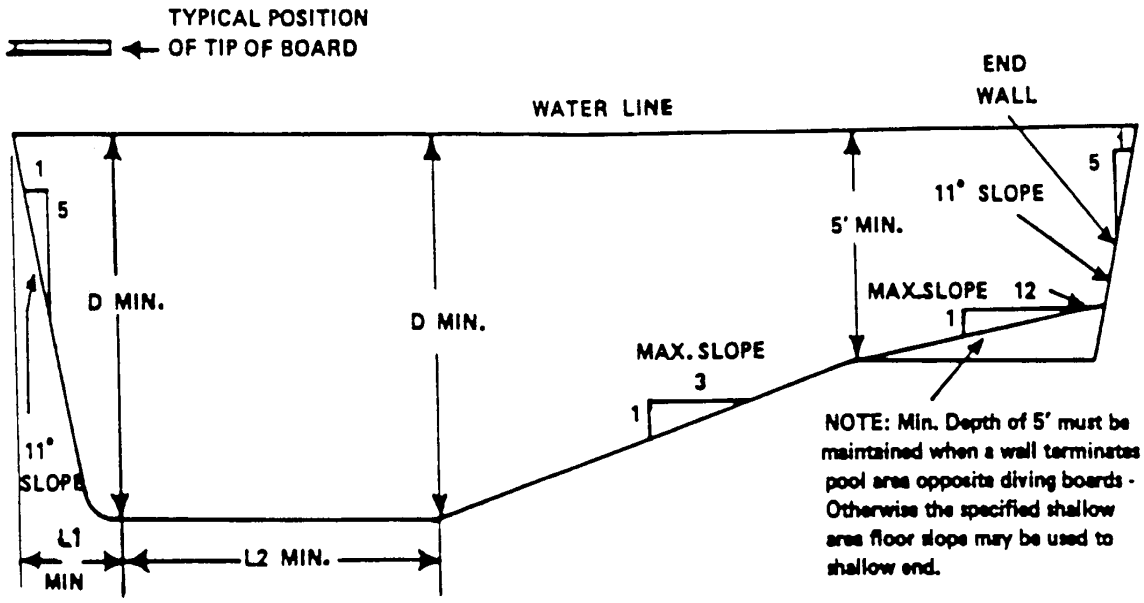

TABLE 1
MINIMUM DIMENSIONS FOR
POOLS WITH DIVING EQUIPMENT

		MINIMUM DIMENSIONS			
Maximum Board Height Over Water	**Maximum Diving Board Length**	**D**	**L_1**	**L_2**	**POOL WIDTH**
26" (2/3 meter)	10'	8' - 6"	2' - 6"	10' - 0"	20' - 0"
30" (3/4 meter)	12'	9' - 0"	3' - 0"	10' - 0"	20' - 0"
1 meter	16'	10' - 0"	4' - 0"	12' - 0"	20' - 0"
3 meter	16'	12' - 0"	6' - 0"	12' - 0"	24' - 0"

4-006.04G4 Placement of boards must observe the following minimum dimensions. With multiple board installations minimum pool widths must be increased accordingly. For diving boards or platforms greater than 20 inches in width, add ½ of the width over 20 inches to the following dimensions.

Center line of 1 Meter or less board to pool side	10' – 0"
Center line of 3 Meter board to pool side	12' – 0"
Center line distance between adjacent boards	10' – 0"

4-006.05 Ladders, Recessed Steps, Stairs

4-006.05A Location: Recessed steps, ladders, or stairs must be provided at the shallow end. Ladders or recessed steps must be provided at the deep end. If the pool is over 30 feet wide, such steps, ladders, or stairs must be installed on each side.

4-006.05B Ladders: Pool ladders must be corrosion-resistant and must be equipped with slip-resistant treads. All ladders must be so designed as to provide a handhold. There must be a clearance of not more than 6 inches nor less than 3 inches between any ladder and pool wall. Treads must be no more than 12 inches apart.

4-006.05C Recessed Steps: Recessed steps must be readily cleanable, slip-resistant, and must be arranged to drain into the pool. Recessed steps must have a minimum tread of 5 inches and a minimum width of 14 inches. Steps must be no more than 12 inches apart.

4-006.05D Handrails: Where recessed steps or ladders are provided, there must be a handrail at the top of each side thereof, extending over the coping or edge of the deck.

4-006.05E Stairs and Stair Handrails: Where stairs are provided, they must be located in a corner of the pool or be recessed. Handrails must be provided at stairs such that all stair areas are within reach of a handrail. Stairs must have slip-resistant finish, a minimum tread of 12 inches, and a maximum rise of 12 inches.

4-006.06 Underwater Seats, Benches, and Swimouts:

4-006.06A Swimouts

1. Must be designed to be located completely outside of the perimeter shape of the pool.

2. The horizontal surface must be 20 inches maximum below water line.

3. A minimum unobstructed surface of 240 square inches must be provided. No other restrictions on sizes apply.

4. When used as an entry/exit access, swimouts must be provided with a step to meet the pool stair requirements.

5. The leading edge must be visibly set apart.

6. Swimouts are allowed in the deep or shallow area of the pool.

4-006.06B Underwater seats and benches must conform to the following:

1. Must be located completely inside of the perimeter shape of the pool.

2. The horizontal surface must be twenty inches maximum below water line.

3. An unobstructed surface must be provided that is a minimum of 10 inches depth and a minimum of 24 inches wide.

4. Must not be used as the required entry/exit access.

5. Underwater seats may be located in deep areas of the pool where diving equipment (manufactured or constructed) is installed, provided they are located outside of the minimum water envelope for diving equipment.

6. Are allowed in conjunction with pool stairs.

7. Leading edge must be visually set apart.

4-006.07 Decks: An unobstructed deck at least 5 feet wide must entirely surround the pool. Infringements or variations are allowed only when specifically permitted by the Department. The deck must be of a uniform, easily cleaned, impervious material with a slip-resistant finish. Wood decks are expressly prohibited within 5 feet of the pool. The deck must be protected from surface runoff.

4-006.07A Slope: The deck must be sloped away from the pool unless drains are provided to intercept water on the way back to the pool, and must be sloped to provide positive drainage of all deck areas.

4-006.07B Drainage: Deck drains, when used, must be no more than 25 feet apart, and no single drain can serve more than 400 square feet of area. Continuous trench-style drains may be designed to handle areas greater than 400 square feet. There must be no direct connection between the pool deck drains and the sewer or

plumbing drainage systems. They must not drain to the pool gutter or recirculation systems.

4-006.07C Roll-Out Gutters: If the pool is equipped with roll-out, deck-level gutters, not more than 5 feet of deck may be sloped toward the gutters.

4-006.07D Carpeting: Carpeting is not permitted on pool decks.

4-006.07E Hose Bibs: At least one hose bib with an appropriate backflow preventer must be provided to facilitate cleaning the deck areas.

4-006.07F Pool Concessions: Where concessions are provided, an area or areas separate from the pool deck must be designated for serving and consuming food or drink.

4-006.07G Drinking Fountain: A minimum of one drinking fountain must be located in the swimming pool area for Class A swimming pools. Each drinking fountain must be connected to a public water system in compliance with the provisions of Title 179.

4-006.07H Lifeguard Chairs: Lifeguard chairs must be provided as required in 178 NAC 2-007.01.

4-006.08 Fencing: The pool area must be completely surrounded by an effective barrier not less than 6 feet high. Any special purpose areas inside the barrier must be fenced or constructed to control traffic. These areas must be designed so they will not drain onto the deck. Any entrance to the pool area must be provided with a self-closing and latching gate/door capable of being locked unless another means of controlling access is provided. Fence openings must be small enough that a 4-inch sphere is not able to pass through.

4-006.09 Lighting, Electrical and Ventilation Requirements

4-006.09A Lighting: During periods of operation sufficient illumination must be provided to allow visibility of all portions of the pools, including the bottom. Illumination must be provided by natural and/or artificial means.

4-006.09A1 Overhead lighting must provide a minimum of three foot candles of illumination at the pool water surface and the adjacent deck area.

4-006.09A2 Underwater lighting must provide a minimum of 1/2 watt per square foot of pool water surface.

4-006.09A3 Underwater lighting requirements may be waived when the overhead lighting provides a minimum of 15 foot candles of illumination at the pool water surface.

4-006.09B Electrical: All electrical installations must conform to the requirements the State Electrical Act, Neb. Rev. Stat. §§ 81-2101 through 81-2143.

4-006.09C Ventilation

4-006.09C1 Room Ventilation: Bathhouses, mechanical equipment rooms, storage areas and indoor swimming pool enclosures must be ventilated. Room ventilation must prevent direct drafts on swimmers and must minimize condensation damage. Dehumidifier, air conditioner, and heat exchanger installations must comply with 178 NAC 4-006.10E and 4-006.10F. A fuel-burning heating unit must be provided with air for combustion and vented to the outdoors.

4-006.10 Water Supply and Waste Water Disposal

4-006.10A Water Supply: Water supplied to a public swimming pool and all related plumbing fixtures, including drinking fountains, lavatories and showers, must use water from a public water system or meet the requirements for coliform bacteria and nitrates that apply to a transient public water system (a minimum of quarterly) (179 NAC 2-002 and 179 NAC 3).

4-006.10B Cross-Connection Control: All portions of the water distribution system serving a public swimming pool and related facilities must be protected against backflow and back siphonage. Water introduced into the pool, either directly or to the recirculation system, must be through an air gap or an appropriate approved backflow preventer as required by the Department.

4-006.10C Sanitary Wastes: An approved method for disposing of sanitary sewage must be provided at a public swimming pool. Where available, a municipal sanitary sewage system must be used. If an individual treatment system must be used, approval of the system must be obtained from the Nebraska Department of Environmental Quality.

4-006.10D Backflow Prevention: In a public swimming pool, the recirculation system and pool deck drains must be protected against the backflow of waste water in a manner approved by the Department.

4-006.10E Condensate: Condensate must not be introduced to the pool water or any part of the recirculation system.

4-006.10F Heat Exchangers: Any heating, dehumidification or cooling system which is connected in any way with the pool recirculation system must contain only nontoxic heat transfer media.

4-006.11 Recirculation System: Each swimming pool must be provided with a recirculation system, which will convey, clarify, chemically balance and disinfect the

swimming pool water. The recirculation system must include pumps, piping, filters, chemical feed equipment, and associated controls and monitoring devices.

4-006.11A Components: Recirculation system components must be certified to ANSI/NSF Standard 50 by an organization accredited by the American National Standards Institute.

4-006.11B Recirculation Rate: A swimming pool recirculation system must be capable of processing one pool volume of water within a given period of time based on depth of water. The following table must be used as minimum design standards for recirculation rate.

Type or Depth of Pool	**Required Turnover Rate**
Spray parks with no standing water	One system volume of water every 30 minutes or less
Pool areas less than or equal to 2 feet in water depth	One pool volume of water every 1 hour or less
Pool areas greater than 2 feet but less than or equal to 3 feet in water depth	One pool volume of water every 2 hours or less
Pool areas greater than 3 feet but less than or equal to 5 feet in water depth	One pool volume of water every 4 hours or less
Pool areas greater than 5 feet in water depth	One pool volume of water every 6 hours or less

4-006.11C Materials: Recirculation system components in contact with the swimming pool water must be of non-toxic material, resistant to corrosion, and able to withstand operating pressures. Acceptable materials are copper, stainless steel, cast iron, ductile iron, plastics approved for potable water contact or other materials suitable for potable water contact.

4-006.11D Pipe Sizing: Swimming pool recirculation system piping must be designed so that the water velocity does not exceed 10 feet per second on the discharge side of the recirculation pump, and 6 feet per second in suction piping. Gravity piping must be sized in accordance with accepted engineering practice with consideration of available head.

4-006.11E Drainage and Installation: All equipment and piping must be designed and fabricated to drain completely by use of drain plugs, drain valves or other means. All piping must be supported continuously or at sufficiently close intervals to prevent sagging. All suction piping must be sloped in one direction, preferably toward the pump. All supply and return pipelines to the pool must be provided with insertable plugs or valves to allow the piping to be drained to a point below the frost line. Provision must be made for expansion and contraction of pipes.

4-006.11F Pipe and Valve Identification: All exposed piping must be clearly marked to indicate function. All valves must be marked to indicate use.

4-006.11G Overflow Systems: All pools must be designed to provide continuous skimming (removal of surface water). Makeup water supply equipment must be provided to maintain continuous skimming.

4-006.11G1 Gutters (Perimeter Overflow Systems): The gutter must extend around the full perimeter of the swimming pool except at stairways and ramps (6 feet or less in width) entering the swimming pool. It must be level within a tolerance of plus or minus 1/8 inch. Piping connections must be provided to permit water to flow from overflows to the recirculation system.

4-006.11G1a Size and Shape: The gutter system must be designed to allow continuous removal of water from the pool's upper surface at a rate of at least 125 percent of the recirculation rate. The gutter must be designed to serve as a handgrip and to prevent entrapment of arms or legs. It must permit ready inspection, cleaning and repair.

4-006.11G1b Outlets: Drop boxes, converters, return piping or flumes used to convey water from the gutter must be designed to handle at least 125 percent of the recirculation rate. Drainage must be sufficient to minimize flooding and prevent backflow of skimmed water into the pool.

4-006.11G1c Surge Capacity: All overflow systems must be designed with an effective surge capacity of not less than 1 gallon for each square foot of pool surface area. Surge must be provided within a surge tank, in the gutter or filter above the normal flow line, or elsewhere in the system. Surge tanks, gutters, and filter tanks must have overflow pipes to convey excess water to waste. Surge tanks must be provided with means for complete draining. In-pool surge is allowed only with an engineered perimeter gutter system which includes an integral surge weir for each 500 square feet of water surface, and a tank to allow balancing of main drain and gutter flows.

4-006.11G2 Skimmers: The use of skimmers is limited to pools with widths of 30 feet or less.

4-006.11G2a Construction: Skimmers must be installed in the pool walls, be sturdy, and be constructed of corrosion-resistant materials. Surface skimmers must bear the ANSI/NSF 50 certification mark or be certified to ANSI/NSF Standard 50 by an organization accredited by The American National Standards Institute.

4-006.11G2b Number: At least one surface skimmer must be provided for each 500 square feet of surface or fraction thereof. Additional skimmers may be required to achieve effective skimming. At least two skimmers must be provided.

4-006.11G2c Location: Skimmers must be so located as to provide effective skimming of the entire water surface with minimum interference and short-circuiting.

4-006.11G2d Flow Rate: Skimmers must provide for a flow-through rate of 30 gallons per minute, or 3.75 gallons per minute per lineal inch of weir, whichever is greater.

4-006.11G2e Control: Skimmers must have weirs that adjust automatically and operate freely and continuously with variations of at least 4 inches in water level. All skimmed water must pass through an easily removable and cleanable basket or screen before encountering control valves or entering the pump suction line. Each skimmer must be equipped with a device to control flow. If a skimmer is connected directly to the recirculation pump suction pipe, it must include a device to prevent an airlock in the suction line. If equalizer pipes are used, they must pass an adequate amount of water to meet pump suction requirements should the water in the pool drop below the weir level. The equalizer pipes must be located at least 1 foot below the lowest overflow level of the skimmer. A valve or equivalent device that will remain tightly closed under normal operating conditions, but automatically opens when the water level drops below the minimum operating level of the skimmer, must be provided on each equalizer pipe.

4-006.11G3 Balancing: The recirculation system must be balanced to provide for optimum and uniform skimming.

4-006.11H Main Drain System (Outlet): Main drains of the pool must be installed in the pool floor at the deepest point. The main drain cover or grate must be a color contrasting with the background.

4-006.11H1 Design and Location: The main drain must be designed to protect against suction entrapment. One or more of the following arrangements must be used:

1. Multiple Drains: Two or more drains must be installed. The drains must be at least 3 feet apart, must be connected in parallel, and must not permit any drain to be individually valved off.

2. Single Drain: A single drain must be a total open area of at least 144 square inches.

3. Antivortex Covers.

4-006.11H2 Spacing: The drains must not be greater than 20 feet on centers, and an outlet must be provided not more than 15 feet from each side wall.

4-006.11H3 Antivortex Covers or Gratings: Main drains must be protected by antivortex covers or gratings. The open area must be large enough so the velocity does not exceed 1.5 feet per second through the grating or antivortex cover. Openings in grates must not be over ½ inch wide. Gratings or drain covers must not be removable without the use of tools.

4-006.11H4 Piping: The piping must be designed to carry 100 percent of the recirculation rate, and must be equipped with a valve.

4-006.11I Entrapment Protection: Outlets must be designed so that each pumping system prevents patron entrapment. Acceptable means include the use of multiple unvalved outlets, an antivortex drain, and a 12-inch by 12-inch square grate or one of equivalent area. Gratings or antivortex covers must not be removable without the use of tools.

4-006.11J Pumps and Strainers

4-006.11J1 Strainers: Strainers must be provided through which all water must pass before entering the pump. The strainers must be of rigid construction, fabricated of corrosion-resistant material, and sufficiently strong to prevent collapsing when clogged. The openings must be no greater than 1/8 inch in any dimension.

The total clear area of all openings must be at least four times the area of the connecting pipe. The strainer must have a quick-opening cover. At least one spare strainer basket must be provided. In systems where the filter is located on the suction side of the pump, strainers are not required.

4-006.11J2 Pumping Equipment: A pump and motor must be provided for the recirculation of the swimming pool water. The pump must provide the recirculation flow rate, and the filter backwash rate unless a separate backwash pump is provided against the total dynamic head generated in the recirculation system. The pump must be self-priming or must be installed so that there is a net positive suction head on the pump inlet whenever the pump is operating. The Department may permit multiple pumps. A gauge which indicates pressure and/or vacuum, as appropriate, must be installed on the pump suction header, and a pressure gauge must be installed on the discharge side of the pump.

4-006.11J3 Pumps and motors must be readily accessible for inspection and service.

4-006.11K Flow Measurement and Control

4-006.11K1 Flow Measurement: A flow meter or other device which gives a continuous indication of the flow rate in gallons per minute in the recirculation system must be provided. Flow meters must have a measurement capacity of at least 1.5 times the design recirculation flow rate, and must be accurate within 10% of the actual flow rate. The indicator must have a range of readings appropriate for the anticipated flow rates, and be installed where it is readily accessible for reading and maintenance, and with straight pipe upstream and downstream of any fitting or restriction in accordance with the manufacturer's recommendation.

4-006.11K2 Flow Regulation: A device for regulating the rate of flow must be provided in the recirculation pump discharge piping.

4-006.11L Inlets: The recirculation system must have inlets adequate in design, number and location to insure effective distribution of treated water and maintenance of uniform disinfectant residual throughout the swimming pool.

4-006.11L1 Number: The number of return inlets must be based on a minimum of one return inlet per 300 square feet of pool surface area or fraction thereof. Wall inlets must be spaced not over 20 feet apart, with one inlet within 5 feet of each corner of the pool and one in each recessed step area.

4-006.11L2 Location: Wall inlets must be located at least 12 inches below the design water surface, or not less than 6 inches if designed to provide downward flow. Bottom inlets must be uniformly spaced, with a separating distance of no greater than 20 feet.

4-006.11L3 Type: Inlet fittings must be of the adjustable rate-of-flow type. Directional flow inlets must be used with skimmer-type pools. Floor inlets must not project from the pool floor. Wall inlets must not extend from the wall more than two inches.

4-006.12 Filtration (General): A swimming pool water treatment system must have one or more filters. Filters must bear the NSF/ANSI Standard 50 certification mark or be certified to ANSI/NSF Standard 50 by an organization accredited by the American National Standards Institute. They must be installed with adequate clearance and facilities for ready and safe inspection, maintenance, disassembly and repair.

4-006.12A Sand Filters

4-006.12A1 Filter Rate: The design filtration rate of rapid sand filters must not exceed 3 gallons per minute per square foot of filter area. High-rate sand filters must not exceed a filtration rate of 15 gallons per minute per square foot. Higher rates may be used if the filter has been successfully tested against NSF/ANSI Standard 50 at the higher rate. The sand filter system must be equipped to backwash each filter at a rate of 15 gallons per minute per square foot of filter bed area, or as recommended by the manufacturer. A flow meter or other device which gives a continuous indication of the flow rate in gallons per minute to indicate the backwash rate for rapid sand filters must be provided. The backwash water must be discharged to waste through a suitable air gap.

4-006.12A2 Filter Media: Sand or other media must be carefully graded and meet the manufacturer's recommendation for pool use.

4-006.12A3 Accessories: Accessories must include both an influent pressure gauge and an effluent pressure gauge or a differential pressure gauge, a backwash sight glass, and an air relief valve. The filter system must have valving and piping to allow isolation, drainage, and backwashing of individual filters, if needed for proper operation.

4-006.12B Diatomaceous Earth- (DE) Type Filters

4-006.12B1 Filter Rate: The design filtration rate for pressure or vacuum filters must be not greater than 1.5 gallons per minute per square foot of effective filter area, except that a maximum filtration rate of 2 gallons per minute per square foot may be allowed for vacuum DE filters only where continuous "body feed" is provided.

4-006.12B2 Precoating: The filter piping must be designed to refilter or waste the effluent until a uniform body coat is applied.

4-006.12B3 Regenerative-Type Filters: Regenerative-type filters must meet the same standards as other pressure filters. Bumping (or agitating) by air or manual means must be provided for, and provision for inspection of elements must be provided.

4-006.12B4 Accessories: Accessories for vacuum filters must include a vacuum gauge and a vacuum limit switch interconnected with the pump. Pressure filters require a backwash sight glass, effluent pressure gauge, influent pressure gauge and air relief valve. Valving and piping must be provided to allow isolation, drainage, and backwashing of individual filters, if needed for proper operation.

4-006.12C Cartridge-Type Filters

4-006.12C1 Filter Rate: The design filtration rate for surface-type cartridge filters must not exceed 0.375 gallons per minute per square foot.

4-006.12C2 Cleaning and Disinfection: Equipment and facilities must be provided for cleaning and disinfection of filter elements.

4-006.12C3 Accessories: Accessories must include both an influent and an effluent pressure gauge or a differential pressure gauge and an air relief valve.

4-006,12C4 Spare Cartridges: An extra set of cartridges, with at least 100% filter area, must be provided.

4-006.13 Disinfection and Chemical Application Equipment

4-006.13A Chemical Feed Equipment: Feeders must be of sturdy construction and materials which will withstand wear, corrosion or attack by the chemical to be used therein, and which are not adversely affected by repeated, regular adjustments or other normal use conditions. The design must minimize potential for blockage.

4-006.13A1 Maintenance: Feeders must be capable of being easily disassembled for cleaning and maintenance.

4-006.13A2 Intended Use: The chemical feeder must be used only for chemicals recommended for use by the feeder manufacturer.

4-006.13A3 Safeguards: The feeders must incorporate antisiphon safeguards so that the chemical cannot continue to feed into the swimming pool, the pool piping system, or the swimming pool enclosure if any type of failure of the pool equipment occurs. Chemical feed systems must be designed to prevent chemical feed when water is not flowing from the recirculation system to the pool.

4-006.13A4 All swimming pools must be provided with automatic pH and disinfectant controllers.

4-006.13B Disinfection: Swimming pools must be designed to provide for continuous disinfection of the pool water with a chemical which is an effective disinfectant, and which imparts an easily measured, active residual.

4-006.13B1 Disinfectant Feeders: An automatic feeder which is easily adjustable must be provided for the continuous application of disinfectant.

4-006.13B2 Capacity: Feeders must be capable of supplying disinfectant at a rate of 0.1 pound per day chlorine (or equivalent) per gallon per minute recirculation flow. This equates to a minimum of 8 parts per million in the recirculation flow. The chemical feed system must be designed to provide a 24-hour supply of disinfectant at the above rate.

4-006.13B3 Gas Chlorination: When compressed chlorine gas is used, the following features must be provided:

4-006.13B3a New Installations: All new installations must be vacuum-type.

4-006.13B3b Location: The chlorine room must be located on the opposite side of the pool from the direction of the prevailing winds during the normal operating season. A separate room must be provided for chlorine and chlorinating equipment. This room must be at or above grade, and have no opening to other interior spaces.

4-006.13B3c Venting: The chlorine room must have an airtight duct beginning a maximum of 8 inches above the floor and terminating at a safe point of discharge to the out-of-doors in a direction away from the pool deck. A ventilating fan, capable of one air change per minute and operated from a switch located outside the chlorine room door, must be provided in conjunction with the airtight duct. A louvered air intake must be provided near the ceiling.

4-006.13B3d Lighting: Adequate lighting must be provided inside the chlorine room with the light switch located outside the chlorine room, adjacent to the chlorine room door.

4-006.13B3e Construction: The enclosure, including the door, must be vandal-resistant. The door of the chlorine room must not open to the swimming pool, and must open outward to the out-of-doors. The door must be provided with a minimum of a 12-inch by 12-inch shatterproof inspection window, and must be provided with "panic hardware" on the inside of the door.

4-006.13B3f Chlorine Cylinders: All full and empty chlorine cylinders must be anchored. The cylinders in use must stand on a scale capable of indicating gross weight with ½-pound accuracy. Storage space must be provided so that all full and empty chlorine cylinders are not subjected to direct sunlight.

4-006.13B3g Injection Location: The mixing of the chlorine gas and water must occur in the chlorine room, except where "vacuum type" chlorinators are used.

4-006.13B3h Backflow: The chlorinators must be designed to prevent the backflow of water or moisture into the chlorine gas cylinder.

4-006.13B3i Safety Features: The chlorine feeding device must be designed to automatically terminate gas feed when the water supply flow is interrupted. The release of chlorine gas must be terminated when the recirculation pump is shut off.

4-006.13B3j Respiratory Protection Device: Respiratory protection equipment, certified to meet the requirements of the National Institute for Occupational Safety and Health (NIOSH), must be available where chlorine gas is handled and must be stored at a convenient location, but not inside any room where chlorine is used or stored. The units must use compressed air, have at least a 30-minute capacity, and be compatible with or exactly the same as units used by the fire department responsible for the facility.

4-006.13B3k Leak Detection: A plastic bottle of ammonia for leak detection must be provided and automatic chlorine detectors must be provided.

4-006.13B3l Emergency Number: The phone number of the fire department or other agency trained in the handling of chlorine leaks must be posted on the outside of the chlorine room door.

4-006.13B3m pH Adjustment: Mechanical feed equipment for the purpose of adding a chemical for pH adjustment must be provided. The capacity must be compatible with the chlorine feed rate to meet the pH requirement in 178 NAC 2.

4-006.13B4 Hypochlorinators: Where hypochlorinators are used, feed must be continuous under all conditions of pressure in the recirculation system.

4-006.13B5 Other Disinfectants: The Department will accept other disinfecting materials or methods when it has been adequately demonstrated that they provide a satisfactory residual which is easily measured and that they are otherwise equally effective under conditions of use as is the chlorine concentration required in 178 NAC 2-005.02D, create no objectionable physiological effects, are not dangerous to public health, and do not impart toxic properties to the water. Feed equipment must bear the ANSI/NSF-50 certification mark or be certified to ANSI/NSF Standard 50 by an organization accredited by the American National Standards Institute and must be installed in accordance with the manufacturer's instructions.

4-006.13C Test Equipment: Test equipment must be provided to permit testing of all water quality parameters affected by chemical addition as specified in 178 NAC 2-005.04.

4-006.14 Bathhouse

4-006.14A General: The term bathhouse refers to the dressing, shower, and sanitary facilities which must be provided adjacent to all swimming pools. Omission of part or all of the pool-side shower and toilet facilities may be approved by the Department when adequate facilities are conveniently available as determined by the Department.

4-006.14B Design Criteria

4-006.14B1 Bathhouse Routing: Location of the bathhouse must be such that the patrons must pass through the bathhouse to enter the pool. The layout of the bathhouse must be such that the patrons, on leaving the dressing room, pass the toilets, then the showers on route to the swimming pool.

4-006.14B2 Bathhouse Design: Floors of the bathhouse must be of smooth-finish material with slip-resistant surface, impervious to moisture, easily cleanable and sloped at least 1/4 inch per foot to drains. Carpeting is not permitted in shower and toilet areas.

4-006.14B3 Fixture Requirements: Unless exempted by 178 NAC 4-006.14A, bathhouse facilities must be provided based on maximum patron load designed for the swimming pool according to the following fixture schedule: Fixtures provided in family changing rooms or other unisex restroom facilities which are available to swimming pool patrons may be included in the required male or female fixture count, but not both.

	Fixtures Required Male				**Fixtures Required Female**		
Total Patron Load	**Toilets**	**Urinals**	**Lavatories**	**Showers**	**Toilets**	**Lavatories**	**Showers**
0-50	1	1	1	1	2	1	1
51-100	1	1	1	1	2	1	1
101-150	1	2	1	2	3	1	2
151-200	1	2	1	2	3	1	2
201-250	2	2	1	3	4	2	3
251-300	2	3	2	4	5	2	4
301-400	2	3	2	5	5	2	5
401-500	3	3	2	6	6	2	6
501-1000	3	4	2	7	7	2	7

1001-1500	4	5	2	10	9	2	10
1501-2000	5	6	2	15	11	2	15
2001 or more	6	7	3	20	13	3	20

4-006.14B3a Showers and Lavatories: Showers must supply water at a temperature of at least 90 degrees Fahrenheit (32°C) and no more than 115 degrees Fahrenheit (46°C) and at a rate of at least 1.5 gallons per minute per shower head. Lavatories must supply water at a temperature of at least 90 degrees Fahrenheit (32°C) and no more than 115 degrees Fahrenheit (46°C). Single temperature showers must supply water at a temperature of at least 90 degrees Fahrenheit (32ºC) and no more than 105 degrees Fahrenheit (41ºC). A circulating pump is required to maintain proper temperatures at all times when the facility is in use. All plumbing must conform to state and local building codes.

4-006.14B4 Suits and Towels: Where towels and/or swimming suits are furnished, facilities must be provided for storage of clean and collection of used items.

4-006.14B5 Foot Baths: The use of foot baths is prohibited.

4-006.14B6 Hose Bibs: Hose bibs must be provided and located to enable the entire bathhouse area to be flushed. All hose bibs must be provided with approved back-siphonage devices to protect the water distribution system for the pool and appurtenant facilities at all times against cross-connection.

4-006.14B7 Ventilation: Bathhouse facilities must be provided with ventilation in accordance with applicable state and local codes.

4-006.14B8 Electric Receptacles: All bathhouse electrical outlets must be protected by ground fault circuit interrupters.

4-006.15 Miscellaneous

4-006.15A Pool Cleaning System: A system must be provided to remove dirt and other foreign material from the bottom of the pool. When a vacuum system is used as an integral part of the recirculation system, connections must be located in the walls of the swimming pool at least 8 inches below the water line, and at such points that the floor of the pool can be cleaned with no more than 50 feet of suction hose. Nothing in this section prohibits the use of surface skimmers for vacuum cleaning purposes.

4-006.15B Manual: The designing architect or engineer must provide a manual for operation of the pool to the owner's representative. Information contained in this

manual must include but is not limited to: instructions for the proper installation, operation, cleaning, winterization and maintenance of all pool equipment; parts list, including drawings; illustrations; charts; operating instructions.

4-006.15C Starting Blocks: Starting blocks, when provided, must be located where the water depth is at least 5 feet. They must be of a removable design.

4-006.15D Sand Area Rinse Showers: Sand areas are not allowed inside the pool enclosure unless separated by an effective barrier to control access to the swimming pool deck. Persons entering the swimming pool from the sand area must pass a water spray or shower which effectively removes sand from the bathers.

4-006.15E Boilers: Where boilers are provided, they must meet the Boilers Inspection Act, Neb. Rev. Stat. §§ 48-719 through 48-743.

4-006.16 Spray Parks: Except as modified by 178 NAC 4-006.16, compliance is required with all other applicable portions of 178 NAC 4-006.

1. All parts of the spray park must be designed, constructed, maintained, and operated so there are no slip, trip, or fall hazards or other conditions that may pose a safety hazard.

2. The splash zone must be properly sloped so that only water from the sprays flows back to the surge tank. Areas adjacent to the splash zone must be sloped away from the collection drains. Plants or vegetation within the immediate area of the splash zone are prohibited.

3. Ponding of water within the splash zone is not allowed.

4. The spray devices must be designed, constructed, and installed so that they do not create a safety hazard. Nozzles that spray from the ground level must be flush with the ground, with openings no greater than one-half inch. Spray devices that extend above the ground must be high enough so they can be clearly seen and are not a trip hazard.

5. The attraction pump(s) and recirculation pump must be electrically interconnected in such a way that the recirculation pump must be on for the attraction pump to operate.

6. The total volume in the surge tank, including all piping, must be at least 4,000 gallons.

7. The volume in the surge tank, including all piping, must be a minimum of 3 times the flow rate of all attraction pumps and the recirculation pump combined, e.g., if the flow rate of all pumps is 2,000 gpm, a volume of at least 6,000 gallons would be needed.

8. The turnover rate for all water in the system must not exceed 30 minutes.

9. The suction intake of the attraction pump in the surge tank must not be located in the immediate vicinity of the suction intake of the recirculation pump. It must be located as close as possible to the recirculation return line.

10. The suction intake from the recirculation pump must be located in the lowest portion of the surge tank.

11. The surge tank must be designed to have easy access for cleaning and inspection.

12. All foggers and jet nozzle sprays that produce finely atomized mists must be connected to a separate potable water source.

4-006.17 Fountains, sprays, or similar features in a swimming pool are permitted only in water depths not exceeding 2 feet. Such features must be of a nonclimbable design, unless specifically manufactured and marketed as a climbing structure. Water supplied to these fountains must come from either the swimming pool (not the surge tank) or from the recirculation system after filtration.

4-006.18 Bridges and Overhead Obstructions: Bridges and overhead obstructions over the pool must be designed so they will not introduce any contamination to the pool water. The minimum height of the bridge or obstruction must be at least eight feet from the bottom of the pool and at least four feet above the surface of the pool. Minimum 42-inch high handrails must be provided along each side of the bridge. The walking surfaces must be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish.

4-006.19 Spas: A spa is a pool designed for recreational use and not drained, cleaned, and refilled for each individual. It may include, but not be limited to, hydrojet circulation, hot water, cold water, mineral baths, air induction systems, or any combination thereof. A pool used under direct supervision of qualified medical personnel is excluded.

4-006.19A General: Requirements for conventional swimming pools may be modified or waived for spas at the discretion of the Department. Except as modified by 178 NAC 4-006.19, compliance is required with all other applicable sections of 178 NAC 4-006.

4-006.19B Physical Separation: A spa pool must be physically separate from any other pool, and there must be no commingling of water between a spa pool and another pool.

4-006.19C Patron Load: The patron load must not exceed one person per 3 lineal feet of seat or bench measured at the front edge.

4-006.19D Maximum Depths: The maximum water depth must be 4 feet measured from the water line. The maximum depth of any seat or sitting bench must be 2 feet measured from the water line.

4-006.19E Stairs, Ladders, and Recessed Treads: Stairs, ladders, or recessed treads must be provided when spa depths are greater than 2 feet. A spa must be equipped with at least one means of egress with handrails for each 50 feet of perimeter or portion thereof.

4-006.19F Deck Widths: A 5-foot minimum width, continuous, unobstructed deck, which may include the coping, must be provided on two sides or 50% or more of the spa. When the spa is adjacent to another pool, the spa must be located at the shallow end, with a minimum distance of 5 feet between the pools.

4-006.19G Water Temperature Controls: Controls must be provided to prevent water temperatures in excess of 104 degrees Fahrenheit (40°C). The controls must be accessible only to the pool operator.

4-006.19H Spa Drainage: Means to completely drain the spa must be provided to allow frequent draining and cleaning.

4-006.19H1 Water Outlets: Water outlets must be designed so that each pumping system in the spa pool (filter system(s) or booster system(s) if so equipped) provides one of the following alternatives:

1. Two outlets whose pipe diameter sizes are equal. (This may be two outlet drains or an outlet drain and a skimmer.) The system must be designed so that an additional main drain is installed if the skimmer line is valved.

2. One antivortex drain. Antivortex drains must not provide a tripping or stubbing hazard. The minimum acceptable diameter for the antivortex is 6 inches.

3. A 12 inch by 12 inch or larger square grate. Grates must not be removable without the use of tools. Any gratings or antivortex covers must not be removable without the use of tools.

4-006.19I Surface Skimmers: One surface skimmer must be provided for each 100 square feet or major fraction thereof of surface area.

4-006.19J Recirculation System Inlets: A minimum of two inlets must be provided.

4-006.19K Air Induction Systems: An air induction system, when provided, must prevent water back-up that could cause electrical shock hazards. Air intake sources must not permit the introduction of toxic fumes or other contaminants.

4-006.19L Disinfectant Feeders: Gas chlorinators must not be used.

4-006.19M Recirculation Rate: The recirculation rate must provide 30 gallons per minute per skimmer, or provide a 30-minute turnover, whichever provides a greater flow rate.

4-006.19N Agitation Systems: The agitation system must be separate from the water treatment recirculation system. The agitation system must be connected to a 10-minute timer located out of reach of a person in the spa.

4-006.19O An emergency shutdown control must be provided and must be accessible from the spa. This control must disable all spa circulation, agitation, air induction systems, as well as other associated mechanical, chemical feed and electrical devices.

4-006.19P Roofs or canopies over spa facilities, when provided, must be constructed so that moisture or condensation from the roof or canopy will not drain into the spa pool. Where a roof or canopy covers the spa pool, the height from the rim of the spa pool to ceiling must be at least 7-1/2 feet.

4-006.19Q All room heating units must be isolated or protected from contact with spa or tub users to prevent injury. The pool or tub room-heating unit must be capable of maintaining a temperature of between 75°F to 82°F.

4-006.19R An in-line thermometer on the spa/hot tub water return line is required.

4-006.20 Wading Pools: A wading pool is a pool that is no more than 24 inches deep that is intended for use by young children.

4-006.20A General: Wading pools require special consideration in design because of the type of user, the relatively small volume of water, and the shallowness of the water. Except as modified by 178 NAC 4-006.20, compliance is required with all other applicable parts of 178 NAC 4-006.

4-006.20B Recirculation

4-006.20B1 Rate: The recirculation rate must provide a turnover of one hour or less.

4-006.20B2 Separate System: A wading pool must have a separate recirculation system from other swimming or wading pools.

4-006.20B3 Surface Skimming: Intermittent fixed weir overflow structures, including gutters, scuppers, and drains at zero depth may be used. The overflow system must have a hydraulic capacity of at least 125 percent of the recirculation flow rate.

4-006.20B4 Skimmer Equalizer Line: A skimmer equalizer line may be connected to the main drain.

4-006.20B5 Inlets: Inlets must be designed and located to distribute treated water to all parts of the wading pool and to move debris to the overflow and drain systems.

4-006.20C Safety

4-006.20C1 Barrier and Location: When a wading pool is in the same enclosure as a supervised swimming pool, there must be a barrier at least 3 feet high between the wading pool and the swimming pool. When a wading pool is adjacent to a swimming pool, it must be near the shallow end of the pool. A self-closing, self-latching gate must be between the wading pool and the swimming pool.

4-006.20C2 Fence: Stand-alone wading pools or wading pools associated with unsupervised swimming pools must be fenced, as required by 178 NAC 4-006.08.

4-006.20C3 Depth Marking: Signs must be provided at the pool indicating the maximum depth in addition to other required depth markings.

4-006.20C4 Steps or Ladders: Steps or ladders are not required at wading pools.

4-006.21 Wave Pools: A wave pool is a special-use pool with wave generating equipment and a design which provides for control of the waves within the side walls and dissipation of the waves at a zero depth shallow end.

4-006.21A General: Wave pools require special consultation with the Department for consideration of design variations and areas where potential problems may exist. Requirements for conventional swimming pools may be modified or waived for wave pools at the discretion of the Department. Except as modified by 178 NAC 4-006.21, compliance is required with all other applicable sections of 178 NAC 4-006.

4-006.21B Depths: The water depth may be reduced to zero at the shallow end to allow for safe access and for dissipation of the waves.

4-006.21C Gutters: Overflow gutters must be provided, but may be omitted along the side of the pool with the wave generating equipment if effective skimming

devices are provided instead. Continuous skimming must be provided during the quiescent period over the entire length of the gutter. The zero depth end must have a continuous trench with a grate.

4-006.21D Decks and Ladders

4-006.21D1 Barriers: A safety railing or other effective barrier at least 42 inches in height must be provided to prevent swimmers from entering the pool at any location other than the zero water depth end. It must have at least one intermediate-height rail or rope.

4-006.21D2 Runout: Runout areas sloping down toward the zero depth trench must not exceed 4 feet.

4-006.21D3 Access: Deck areas accessible to swimmers may be omitted along the side of the pool with the wave generating equipment.

4-006.21D4 Ladders: Ladders must be of a recessed design.

4-006.21E Waves

4-006.21E1 Magnitude: The wave generating equipment must not be capable of producing waves of a magnitude which could cause swimmers to have contact with the pool bottom in the deep end.

4-006.21E2 Emergency Shutoff: An emergency shutoff for the wave generating equipment must be provided at every lifeguard chair at a minimum. At least four emergency shutoffs must be provided.

4-006.21F Openings

4-006.21F1 Inlet: The zero depth area must have bottom inlets.

4-006.21F2 Openings to Wave Generating Equipment: Openings to wave generating equipment must be designed to prevent entrapment of swimmers.

4-006.22 Zero Depth Pools (Other than wading pools)

4-006.22A General: Except as modified by 178 NAC 4-006.22, zero depth pool facilities must comply with all other applicable provisions of 178 NAC 4-006.

4-006.22B Zero Depth End: A gutter or trench with a grate cover is required along all zero depth areas. It must be at an elevation that allows effective skimming at the trench at all times.

4-006.22C Runout: Runout areas sloping toward the zero depth trench must not exceed 6 feet.

4-006.22D Bottom Inlets: A system of bottom inlets must be provided in the shallow end, designed to provide the equivalent of a two-hour turnover for that area.

4-006.23 Pool Slides: All slides used at pools must be specifically designed and intended for use with a pool, and for the specific application. An emergency shutdown control must be provided for all water slides. This control must stop all water flow on the slide and must be mounted in a convenient location for lifeguards or for slide users, if no lifeguards are present.

4-006.23A Children's Activity Slides: Children's activity slides are small slides with a low exit velocity designed by the manufacturer for use by small children at pools. They must be designated by the manufacturer for use in 24 inches or less of water, and installed accordingly.

4-006.23B Drop Slides: A drop slide is a slide which discharges to a pool with a drop of more than 2 inches to the water surface.

4-006.23B1 Entry: Slide entry areas must be designed so the rider is able to properly enter and position him or herself before sliding down the chute. This area must be a small platform or a less-sloped portion of chute, with well-placed assist bars.

4-006.23B2 Handrails: Drop slides must have handrails on both sides of the ladder or steps. Platforms and landings must have 42-inch-high guardrails, with at least one intermediate-height rail.

4-006.23B3 Landing Area: There must be a drop slide landing area extending 5 feet on either side of the center line of the slide and from the back wall to 20 feet in front of the slide terminus. This area must not infringe on the required landing areas for other drop slides, water slides, or diving equipment.

4-006.23B4 Landing Area Designation: The drop slide landing area must be clearly designated by float ropes. A slide mounted in a separate diving area may be allowed to use the diving area separation as long as access to the diving well is restricted to patrons using the slide and diving equipment.

4-006.23B5 Slide Terminus: The terminus of the chute must extend beyond the pool wall, and be so oriented that the safety area in front of the slide does not interfere with the safety area of another slide or other pool equipment.

4-006.23B6 Exit Angle: The maximum angle of the slide runway at the exit must be between zero degrees and 11 degrees, measured downward from horizontal.

4-006.23B7 Water Depth: The area from the slide terminus outward 6 feet in front of the slide terminus must have a depth as established from the table below. The slide must be constructed so the rider enters the water in this 6-foot area. If the depth is 5 feet or less, the bottom in this area must have a maximum slope of 1 inch in 12 inches (1:12), and the slide must be located at least 5 feet from any change to steeper slope of the pool bottom.

Water Depth from the Slide Terminus to 6 Feet in Front of the Terminus (see above)	Corresponding Maximum Exit Height Above the Water
4 feet minimum	12 inches
8 feet minimum	42 inches

4-006.23B8 Maximum Drop: The maximum drop height at the terminus of the slide must not exceed 42 inches.

4-006.23B9 Pump Intake: If water is pumped from a swimming pool to the slide, the pump intake must be enclosed or constructed in a manner to prevent injury or entrapment of swimmers. Intake velocity must not exceed 1-1/2 feet per second. Water from a surge or balance tank must not be used. Gratings or antivortex covers must not be removable without the use of tools.

4-006.23C Flume Water Slides: A flume water slide consists of one or more flumes entering a plunge pool or dedicated plunge area of a multiple use pool at or near the water level.

4-006.23C1 General: Water slides require special consultation with the Department for consideration of design variations and areas where potential problems may exist. Requirements for conventional swimming pools may be modified or waived for water slides at the discretion of the Department. Except as modified by 178 NAC 4-006.23, compliance is required with all other applicable sections of 178 NAC 4.

4-006.23C2 Flumes

4-006.23C2a Position: A flume must be perpendicular to the plunge pool wall for a distance of at least 10 feet from the exit end of the flume.

4-006.23C2b Clearances: The distance between the side of a flume terminus and a plunge pool side wall must be at least 4 feet. The distance between sides of adjacent flume terminuses must be at least 6

feet. The distance between a flume exit end and the opposite side of the plunge pool, excluding steps, must be at least 20 feet.

4-006.23C2c Elevation: A flume must terminate at a depth between 6 inches below the plunge pool operating water surface level and 2 inches above the water surface level. The flume must not exceed a one-in-ten slope for a distance of at least 10 feet from its exit end.

4-006.23C2d Design: The design of the flume must minimize abrupt contact with the slide and prevent people from being airborne.

4-006.23C3 Plunge Pools

4-006.23C3a Depths: The plunge pool operating water depth at the end of a flume must be 3 to 4 feet. A depth of at least 3 feet must be maintained in front of the flume for a distance of at least 10 feet, from which the pool floor may have a constant slope upward.

4-006.23C3b Plunge Area: The plunge area in multi-use pools must be designated by float ropes, and each area must have ladders, steps, or stairs for egress.

4-006.23C4 Flume Pumps

4-006.23C4a Intakes: The flume pump intake(s) must be designed to prevent patron entrapment. The water velocity through the intake(s) cover(s) must be no greater than 1-1/2 feet per second. The intake cover(s) must be designed to be easily cleaned.

4-006.23C4b Check Valves: Each flume pump discharge pipe must have a check valve.

4-006.23C4c Walkways: A 4-foot minimum width, surfaced walkway or steps must be provided between the plunge pool deck and the steps leading to the top of the flume(s).

4-006.23C4d Pump Reservoir: If a separate pump reservoir is provided, it must have a main drain and surface skimmer, both connected to the recirculation system.

4-006.23C4d1 Recirculation Rate: The recirculation rate for a dedicated plunge pool must provide a turnover of 1 hour or less. Multiple use pools with water slides must have a turnover of one hour or less in the plunge area of the pool.

4-006.24 Lazy River Rides: Except as modified by 178 NAC 4-006.24, compliance is required with all other applicable parts of 178 NAC 4.

4-006.24A Construction Material: Lazy River Rides must be constructed of concrete or other impervious materials with a nontoxic, smooth and slip-resistant finish. These rides must be of such shape and design as to be operated in a safe and sanitary manner.

4-006.24B Water Depth: The maximum water depth of the Lazy River Ride must not exceed four feet.

4-006.24C Decks: Decking must be provided at the entrance and exit points as necessary to provide safe patron access but must not be smaller than 10 feet in width and length. Additional decking along the ride course is not required except that decking is required at lifeguard locations and emergency exit points.

4-006.24D Emergency Exit Locations: Access and exit must be provided at the start and end of the ride only, except that emergency exit locations may be located along the ride course as necessary to provide for the safety of the patrons.

4-006.24E Patron Loading: 25 square feet of Lazy River water surface area must be provided for each patron.

178 NAC 4 Attachment 1

Application for a Waiver

Project Number P- _____

PART I (To be completed by the applicant):

1. Name of Owner _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

2. Name of Plan, Project, or Product _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

3. Name of Contractor _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

4. Engineer's/Architect's Name and Nebraska License # _____

5. State reason(s) for waiver request. Attach three copies of applications, drawings, specifications, photos, etc., that clearly illustrate this waiver request. (Attach separate sheet if necessary.)

_____

_____

_____

6. Specific section(s) of 178 NAC 4 for which waiver is requested.

_____

_____

_____

7. State hardship and justification as to why the waiver would relieve the hardship. (Attach separate sheet if necessary.)

_____

_____

_____

_____

8. State any additional reason or provide any technical documentation to support your supposition that a waiver would not likely result in an impairment to public health. (Attach a separate sheet if necessary.)

_____

_____

_____

- ❑ Approved
- ❑ Disapproved

_____
Engineering Services Program Manager Date

Comments:

_____

_____

_____

178 NAC 4 Attachment 2

Application for a Variance

Project Number P- _____

PART I (To be completed by the applicant):

1. Name of Owner _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

2. Name of Plan, Project, or Product _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

3. Name of Contractor _____

   Street Address _____ City _____

   State _____ Zip _____ Telephone (___) _____

4. Engineer's/Architect's Name and Nebraska License # _____

5. State reason(s) for variance request. Attach three copies of applications, drawings, specifications, photos, etc., that clearly illustrate this variance request. (Attach separate sheet if necessary.)

_____

_____

_____

6. Specific section(s) of 178 NAC 4 for which variance is requested.

_____

_____

_____

7. State hardship and justification as to why the variance would relieve the hardship. (Attach separate sheet if necessary.)

_____

_____

_____

_____

8. State any additional reason or provide any technical documentation to support your supposition that a variance would not likely result in an impairment to public health. (Attach a separate sheet if necessary.)

_____

_____

_____

- ❑ Approved
- ❑ Disapproved

_____
Engineering Services Program Manager Date

Comments:

_____

_____

_____

FOR DEPARTMENT USE ONLY
Date Submitted: _____
Project #: P- _____-_____
Reviewed By: _____

178 NAC 4 Attachment 3

Swimming Pool Data and Check Sheet

Name of Pool			
Owner of Pool			
Address of Pool			
Telephone	( )	Fax	( )

Name of Engineering or Architectural Firm			
Contact Person			
Address			
Telephone	( )	Fax	( )

Estimated Pool Cost	$
Initial Review Fee [$100.00 + ½ of 1% of Estimated Pool Cost (Maximum $7,600.00)]	
Estimated Date to Start Construction	

Pool Type

Indoor _____ Outdoor _____

Purpose/Type of Pool (Circle all that apply)

Standard Swimming Pool Zero Depth Pool Wave Pool Slide Plunge Pool Wading Pool Diving Pool Spray Park Other _____

Will an operation and maintenance manual be provided to the owner? _____

Required Signage _____
Depth markings _____

Safety Requirements
Boundary line between deep and shallow marked? _____

Preliminary Plans: If preliminary plans were submitted, please include copies of correspondence and indicate if any changes were made.

Waiver or Variance: If a waiver or variance is being requested, please fill out Attachment 1 or Attachment 2 as appropriate.

Maximum Patron Load
Pool surface area with depth of 5 feet or more _____ ft^2
Pool surface area with depth of 5 feet or less _____ ft^2

Construction Material

Pool Basin Construction
Material _____
Paint/Finish _____
Color _____

Decks
Unobstructed width of deck (Minimum) _____ ft. Slope _____in/ft
Deck Drainage to: Grade _____ Drains _____

Fencing
Fence height at least 6 feet _____
Fence openings 4" maximum _____

Lighting, Electrical, Ventilation

Is lighting provided for nighttime use? _____ If yes, amount of overhead lighting _____f.c.
Amount of underwater lighting _____ watts/ft^2 of pool surface

Is ventilation provided for bathhouse and equipment room? _____

Water Supply and Wastewater Disposal
Water Source: _____ (Individual well, municipal supply, specify other)
Protection against backsiphonage (Type) _____ (Air Gap, RPZ, specify other)
Filter backwash to _____ Air Gap provided: _____inches
If sanitary sewer: Size _____ inches Location _____
Pool drains to _____ Location _____
Bathhouse waste discharge to
Municipal sewer system _____ Septic tank system _____

Recirculation Systems

Overflow Gutters (if used)
Type_____(Stainless Steel, concrete form, other)

Skimmers (if used)
Number _____ Make _____ Model _____

Do skimmers include a device to prevent airlock if directly connected to pump suction? _____

Main Drain(s)

Number _____ Size _____ Pipe Size _____ Grating/Antivortex Cover _____
Effective open area of main drain grating/antivortex cover _____ sq. in.
Is a valve provided on main drain line? _____

Pump Data

	Number Installed	**Spare Basket(s)**	**Make**	**Model**	**Capacity (gpm)**	**Hp**
Swimming Pool						
Wading Pool						
Slide						
Other						

	Swimming Pool	**Wading Pool**	**Zero Depth Pool**	**Other**
Volume (gallons)				
Surface Area (sq. ft)				
Perimeter (feet)				
Filtered Return Water Flow Rate (gpm)				
Turnover Times (hrs)				

Filtering

	Sand	**D.E.**	**Cartridge**	**Other**
Pressure				
Vacuum				
Gravity				
Maximum Capacity gpm/ft^2				
Effective Surface Area ft^2				
Manufacturer				
Model				

Please Specify Other _____

Filter Accessories:

Backwash rate _____ gpm/ft^2 Backwash sight glass _____

Air relief valve _____ Pressure gauge _____

Valves and piping for regulating flow for filtering _____

Disinfection

Manufacturer _____ Model # _____

Chemical Used:
Chlorine _____
Bromine _____
Other (specify) _____

Type of Disinfection Equipment
Gas _____
Liquid NaOCl _____
Erosion Feeder _____
Other (specify) _____

Gas Chlorine Room

Location _____ Fan switch and light switch interlocked? _____

Ventilation fan _____ cfm Lighting _____ Scale provided _____

Observation window (12 inch by 12 inch minimum) _____

Panic hardware on door _____ Respiratory Protection Device _____

Safety Signs _____

Wall Inlets _____ **Floor Inlets** _____

Number _____ Number _____

Discharge depth _____ inches

Diving Boards (Indicate Number)
Deck level _____ 1 meter _____ 3 meter _____ Other _____

2/3 meter _____ 3/4 meter _____

Slides
Height of slide exit above water _____
Slide pump capacity (gpm) _____
Effective open area of pump suction grating _____

Bathhouse Fixtures

	Number of Fixtures	
	Women's Side	**Men's Side**
Shower Heads		
Private Shower		
Water Closets		
Urinals		
Private Dressing Booths		
Lavatories		

178 NAC 4 Attachment 4

Certification of Construction

Pursuant to Title 178 NAC 4, construction of the_____

_____

_____

located at _____

_____

_____

was completed on _____, 20_____

I certify that to the best of my knowledge and belief, said construction has been performed in substantial compliance with Title 178 NAC 4, and in accordance with the approved plans and specifications or approved change orders.

_____ _____
Signature Date

Registration # _____

Final Fee

In accordance with 178 NAC 4-003.01 item 6.b., documentation of the contract or actual cost of the project must be provided to the Department for the purpose of determining the final fee amount. Payment of the final fee amount must be made to the Department before the project is placed into service.

Final contract or actual project cost $ _____